CHARGE NUMBER: Various

PROGRAM TITLE: Analytical Investigation

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I. PHENOLS IN TPM

An automated procedure for the determination of phenols in TPM has been developed. The determination is made on steam distillates of TPM made acid with hydrochloric acid. Extraction of the red-colored product formed by the reaction of aminoantipyrine and the phenols is not necessary. The analytical results compare well with those obtained with the manual extraction procedure. Work is in progress to make this automated procedure applicable to determining phenols in condensate samples.

II. SULFATE IN RCB

Work is in progress to automate the determination of sulfate in RCB and tobacco leaf. The ashed sample is taken up in hydrochloric acid and sulfates determined turbimetrically by their reaction with barium chloride. Preliminary results compare well with the gravimetric procedure now in use.

III. FILTER EFFICIENCY

A method for the determination of the removal efficiency of various vapor phase materials by a variety of filters has been developed. Removal efficiency for carbon filters is related to the vapor pressure of the material under investigation. For cellulose acetate and paper filters, the primary mechanism appears to be absorption with the efficiency being related to the type of compound being filtered. The deposition of smoke has a dramatic effect on the efficiency of the filters. Carbon filters in general are deactivated by smoking, while cellulose acetate and paper filters become more efficient when smoked.

IV. MENTHOL POLYMER

A. A technique has been developed to determine [poly-(l-menthol-1,1-dimethylallyl carbonate)], a menthol additive to cigarette paper and tobacco filler by gel permeation chromatographic analysis.

IV. MENTHOL POLYMER (Continued)

B. Curie point pyrolysis was used for the determination of the menthol content of [poly-(1-menthol-1,1-dimethylallyl carbonate)] and for the determination of this polymer on filler. Good precision with no apparent breakdown of menthol is obtained at a 500°C - 4 second pyrolysis. The polymer was found to release 54% menthol versus 58% theoretical.

V. SUGAR ANALYSIS

The following sugars have been silylated and separated by gas chromatography giving a single peak for each sugar: arabinose, ribose, xylose, rhamnose, fructose, mannose, galactose, α-glucose, β-glucose, sucrose, maltose, andiso-maltose. Sorbose, if present, interferes with galactose. The procedure has been successfully applied to the analysis of sugar syrups and is being extended to the study of filler sugars.

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